

**ARTHUR CREEK
WBID 1595**

Recreational Use Attainability Analysis

May 2007

PREPARED FOR:
RFP No: B3Z07134
Water Quality Monitoring & Assessment Section
Water Protection Program
Division of Environmental Quality
MISSOURI DEPARTMENT OF NATURAL RESOURCES
301 West High Street
Jefferson City, MO 65102

PREPARED BY:
MEC WATER RESOURCES, INC.
1123 Wilkes Blvd., Ste. 400
Columbia, MO 65201

Field Data Sheets for Recreational Use Stream Surveys

CHK 5/17/07

Data Sheet A - Water Body Identification

I. Water Body Information (For water body being surveyed)

Water Body Name (from USGS 7.5' quad):	Arthur Creek ^{nm} Arthur Creek
Missouri Water Body Identification (WBID) Number:	1595
8-digit HUC:	010290202
County:	Texas
Upstream Legal Description (from Table H):	14, 31N, 9W
Downstream Legal Description (from Table H):	26, 31N, 9W
Number of sites evaluated	1
List all sites numbers, listed consequently upstream to downstream:	Site 1

II. Subsegmentation (fill this section out only in cases where subsegmentation is being proposed)

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Upstream Coordinates:		Downstream Coordinates:	
UTM X	Y	UTM X	Y
HORIZONTAL COLLECTION METHOD (Indicate the method used to determine the locational data.)			
Global Positioning System (GPS)		Interpolation	
Static Mode		Topographic Map or DRG	
Dynamic Mode (Kinematic)		Aerial Photograph or DOQQ	
Precise Positioning Service		Satellite Imagery	
Signal Averaging		Interpolation Other	
Real Time Differential Processing			
HORIZONTAL ACCURACY ESTIMATE			
GPS Data Quality		Interpolation Data Quality	
FOM	± _____ Meters	Source Map Scale: 1:24,000 1:100,000 Other _____	
EPE	± _____ Feet or ± _____ Meters	_____	
PDOP		± _____ Feet or ± _____ Meters	

III. Discharger Facility Information (list all permitted dischargers on the stream)

Discharger Facility Name(s):	Raymondville WWTP
Discharger Permit Number(s):	MO0119954

IV. UAA Surveyor (please print legibly)

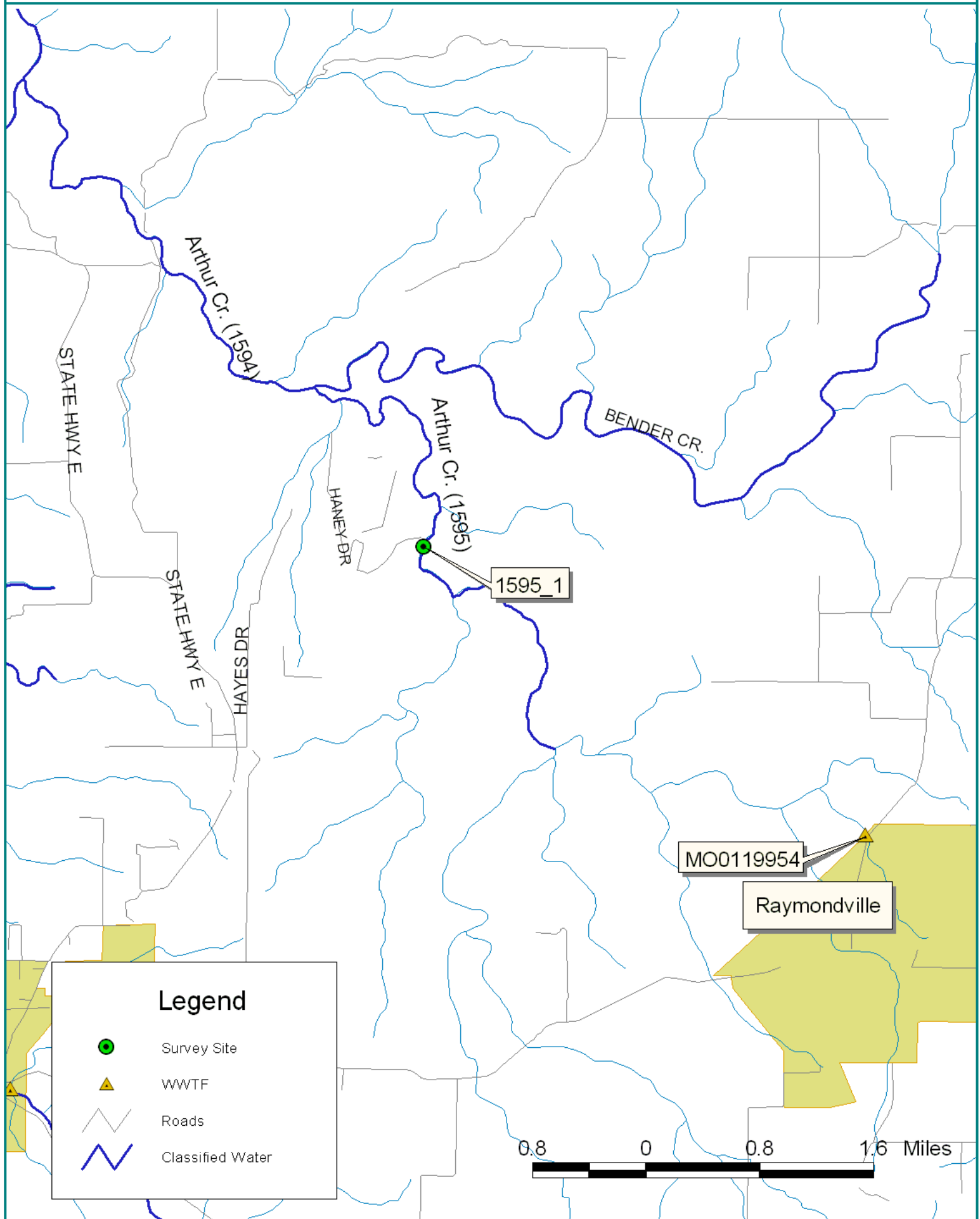
Name of Surveyor	Nick Muenks	Telephone Number:	573-443-4100
Organization/Employer:	MEC Water Resources		
Position:	Water Quality Scientist		

Please verify that you have completed all sections, checked all applicable boxes and that everything is complete.

Signed: Nick Muenks Date: 5/7/07

CHK 5-14-07

Arthur Creek (1595), Length = 4.0 mi., Permit # MO119954



WBID# 1595
 Site# 1

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B - Site Characterization (must be completed for each site)

Date & Time: <u>5/7/07 1524</u>	Site Location Description (e.g., road crossing): <u>Private Property at end of Arthur Creek Dr</u>
Personnel (Data Collectors): <u>NM/JR</u>	
Current Weather Conditions: <u>Partly Sunny</u>	Facility Name: <u>Raymondville WWTP</u>
	Permit Number: <u>MO 0119954</u>
Weather Conditions for Past 10 days:	
Drought Conditions?: No drought <input checked="" type="checkbox"/> ; Phase I <input type="checkbox"/> ; Phase II <input type="checkbox"/> ; Phase III <input type="checkbox"/> ; Phase IV <input type="checkbox"/> ; Unknown <input type="checkbox"/>	

Site Locations:

LOCATION COORDINATES (UNIVERSAL TRANSVERSE MERCATOR PROJECTION, IN METERS)			
Site GPS Coordinates: UTM X: <u>0597732</u>		Y: <u>4137803</u>	
HORIZONTAL COLLECTION METHOD (Indicate the method used to determine the locational data.)			
Global Positioning System (GPS)		Interpolation	
Static Mode	<input checked="" type="checkbox"/>	Topographic Map or DRG	
Dynamic Mode (Kinematic)		Aerial Photograph or DOQQ	
Precise Positioning Service		Satellite Imagery	
Signal Averaging		Interpolation Other	
Real Time Differential Processing			
HORIZONTAL ACCURACY ESTIMATE			
GPS Data Quality		Interpolation Data Quality	
FOM	± _____ Meters	Source Map Scale: 1:24,000 1:100,000 Other _____	
EPE	± <u>22</u> Feet or ± _____ Meters	± _____ Feet or ± _____ Meters	
PDOP			

Photos:

Photo ID# (WBID Site# ##)	Photo Purpose and Direction (upstream, downstream, other)	Photo ID# (WBID Site# ##)	Photo Purpose and Direction (upstream, downstream, other)
<u>15951535</u>	<u>Downstream Transect 1</u>	<u>15951539</u>	<u>Upstream Transect 1</u>
<u>15951536</u>	<u>Downstream Transect 1</u>	<u>15951540</u>	<u>Home + Camper along Creek (taken from T11)</u>
<u>15951537</u>	<u>Upstream Transect 1</u>	<u>15951541</u>	<u>Downstream view from Transect 11</u>
<u>15951538</u>	<u>Upstream Transect 1</u>		

Uses Observed*: (Uses actually observed at time of survey.)

<input type="checkbox"/> Swimming	<input type="checkbox"/> Skin diving	<input type="checkbox"/> SCUBA diving	<input type="checkbox"/> Tubing	<input type="checkbox"/> Water skiing
<input type="checkbox"/> Wind surfing	<input type="checkbox"/> Kayaking	<input type="checkbox"/> Boating	<input type="checkbox"/> Wading	<input type="checkbox"/> Rafting
<input type="checkbox"/> Hunting	<input type="checkbox"/> Trapping	<input type="checkbox"/> Fishing	<input checked="" type="checkbox"/> None of the above	<input type="checkbox"/> Other:

Describe: (Include number of individuals recreating, photo-documentation of evidence of recreational uses, etc. Use Data Sheet D- Recreational Use Interview when conducting interviews.)
Data sheet D completed -

Surrounding Conditions*: (Mark all that promote or impede recreational uses. Attach photos of evidence or unusual items of interest.)

<input type="checkbox"/> City/county parks	<input type="checkbox"/> Playgrounds	<input type="checkbox"/> MDC conservation lands	<input type="checkbox"/> Urban areas	<input type="checkbox"/> Campgrounds
<input type="checkbox"/> Boating accesses	<input type="checkbox"/> State parks	<input type="checkbox"/> National forests	<input type="checkbox"/> Nature trails	<input type="checkbox"/> Stairs/walkway
<input checked="" type="checkbox"/> No trespass sign	<input type="checkbox"/> Fence	<input checked="" type="checkbox"/> Steep slopes	<input type="checkbox"/> None of the above	<input type="checkbox"/> Other:

Comments: Private Property Sign as posted as you approach on Cnty Rd

WBID# 1595
Site# 1

Field Data Sheets for Recreational Use Stream Surveys

Data Sheet B - Site Characterization (must be completed for each site)

Indications of Human Use*: (attach photos)

<input checked="" type="checkbox"/> Roads	<input type="checkbox"/> Rope swings	<input checked="" type="checkbox"/> Foot paths/prints	<input type="checkbox"/> Dock/platform	<input type="checkbox"/> Livestock Watering	<input type="checkbox"/> RV / ATV Tracks
<input type="checkbox"/> Camping Sites	<input type="checkbox"/> Fire pit/ring	<input type="checkbox"/> NPDES Discharge	<input type="checkbox"/> Fishing Tackle	<input type="checkbox"/> Other:	
Comments: <u>Home on west bank of stream</u>					

Stream Morphology:

Upstream View's Physical Descriptions: Is there any water present at this view? ☒ Yes ☐ No

If so, is there an obvious current? ☒ Yes ☐ No

Select one of the following channel features:

Channel Feature	Transect (#)	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE	<u>05</u>	<u>50</u>	<u>14.80</u>	<u>12</u>		<u>0.24</u>
RUN	<u>02</u>	<u>20</u>	<u>7.05</u>	<u>40</u>		<u>0.47</u>
POOL	<u>09^m 10</u>	<u>50</u>	<u>12.40</u>	<u>90^m 120</u>		<u>0.95</u>

Downstream View's Physical Descriptions: Is there any water present at this view? ☐ Yes ☐ No

If so, is there an obvious current? ☐ Yes ☐ No

Select one of the following channel features:

Channel Feature	Distance from access (m)	Width (m)	Length (m)	Median Depth (m)	Max. Depth (m)
RIFFLE					
RUN					
POOL					

Substrate*: (These values should add up to 100%.)

<u>30</u> % Cobble	<u>50</u> % Gravel	<u>10</u> % Sand	<u>5</u> % Silt	<u>5</u> % Mud/Clay	<u>0</u> % Bedrock
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Aquatic Vegetation*: (Note amount of vegetation or algal growth at the assessment site.)

Benthic algae growing on much of substrate, aquatic veg present in 90% of assessment sites

Water Characteristics*: (Mark all that apply.)

ODOR:	<input type="checkbox"/> Sewage	<input type="checkbox"/> Musky	<input type="checkbox"/> Chemical	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:
COLOR:	<input checked="" type="checkbox"/> Clear	<input type="checkbox"/> Green	<input type="checkbox"/> Gray	<input type="checkbox"/> Milky	<input type="checkbox"/> Other:
BOTTOM DEPOSIT:	<input type="checkbox"/> Sludge	<input type="checkbox"/> Solids	<input checked="" type="checkbox"/> Fine sediments	<input type="checkbox"/> None	<input type="checkbox"/> Other:
WATER SURFACE DEPOSITION:	<input type="checkbox"/> Oil	<input type="checkbox"/> Scum	<input type="checkbox"/> Foam	<input checked="" type="checkbox"/> None	<input type="checkbox"/> Other:

Comments: Please attach any additional comments to this form.

*This information is not to be used solely for removal of a recreational use designation but rather is to provide a more comprehensive understanding of water conditions. Consequently, this information is not intended to directly influence a decision on the recreation use analysis but may point to conditions that need further analysis or that affect another use.

Please verify that you have completed all sections, checked all applicable boxes and that everything is complete.

Surveyor's Signature: [Signature] Date of Survey: 5/7/07

Organization: MEC Water Resources Position: Water Quality Scientist

MEC Recreational Use Attainability Analysis Field Survey Sheet

Dissolved Oxygen

Waterbody ID: 1595 Site #: 1
(WBD Site#)Date: 5/7/07 Time: 17:24Estimated Channel Incision: 0.05 (m) (height between low bank width and water)Dissolved Oxygen: 8.75 (mg/L)GPS Location (taken at transect 1): X^{nm}UTM: 4137803 UTM: 0597732Dissolved Oxygen: 97.8 (% sat)Horizontal Accuracy Estimate (GPS Data Quality): +/- 22 (feet)Specific Cond: 163.1 (µS/cm)Average Stream Width: 8.0 (meters) Length of Survey Segment: 160 (meters)Water Temperature: 21.1 (°C)Field Staff: Nick Muenks Senad Roberts

Transect Cross-Section

Measurement	01		02		03		04		05		06		07		08		09		10		11	
	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)	Distance (m)	Depth (m)
1	1.40	0.11	0.45	0.10	0.20	0.10	0.40	0.20	0.50	0.10	0.60	0.10	0.30	0.10	0.0	0.12	0.30	0.15	0.10	0.21	0.20	0.10
2	2.05	0.17	1.10	0.18	1.40	0.10	0.92	0.25	1.30	0.13	2.00	0.26	1.45	0.37	1.30	0.49	1.30	0.42	1.20	0.73	1.30	0.31
3	2.70	0.18	1.75	0.31	2.60	0.10	1.44	0.27	2.10	0.16	3.40	0.28	2.60	0.41	2.60	0.45	2.30	0.67	2.30	0.95	2.40	0.33
4	3.35	0.28	2.40	0.38	3.80	0.12	1.96	0.27	2.90	0.19	4.80	0.25	3.75	0.41	3.90	0.41	3.30	0.75	3.40	0.80	3.50	0.36
5	4.00	0.35	3.05	0.45	5.00	0.22	2.48	0.23	3.70	0.24	5.20	0.30	4.90	0.45	5.20	0.40	4.30	0.66	4.50	0.55	4.60	0.36
6	4.65	0.30	3.70	0.45	6.20	0.27	4.00	0.16	4.50	0.16	7.60	0.21	6.05	0.50	6.50	0.42	5.30	0.60	5.60	0.33	5.70	0.36
7	5.30	0.30	4.35	0.47	7.40	0.27	4.52	0.10	5.30	0.16	9.00	0.27	7.20	0.51	7.80	0.48	6.30	0.53	6.70	0.24	6.80	0.36
8	5.95	0.19	5.00	0.44	8.60	0.34	5.04	0.10	6.10	0.10	10.40	0.33	8.35	0.50	9.10	0.50	7.30	0.47	7.80	0.23	7.90	0.33
9	6.60	0.15	5.65	0.34	9.80	0.38	5.56	0.14	6.90	0.16	11.80	0.40	9.55	0.50	10.40	0.60	8.30	0.37	8.90	0.14	9.00	0.25
10	7.25	0.12	6.30	0.16	11.00	0.31	6.08	0.16	7.70	0.14	13.20	0.61	10.70	0.44	11.70	0.55	9.30	0.27	9.00	0.10	10.10	0.19
11	7.90	0.11	6.95	0.10	12.20	0.15	6.60	0.15	8.50	0.11	14.60	0.13	11.85	0.22	13.00	0.25	10.30	0.12	10.10	0.10	11.20	0.10
12	8.35	0	7.05	0	13.55	0	7.10	0	14.80	0	14.80	0	12.05	0	13.00	0	11.00	0	12.40	0	13.00	0
Feature Type (riffle run, or pool)	run	run	pool	run	run	run	riffle	run	run	run	pool	pool	pool	pool	pool	pool	pool	pool	pool	pool	pool	pool

Notes: Transects will be measured beginning on left descending bank and finishing on right descending bank.

GPS location corresponds to Transect 01. Transects ordered in upstream to downstream order.

Transects in order of up to downstream.

Mark dry depth measurements as 0, measurements less than 0.1m as <0.1, and greater than 1m as >1

Measurement 1 depth = 0.1m (unless depth is insufficient); Measurement 11 depth = 0.1m (unless depth is insufficient); Measurement 12 distance = entire wetted width distance and depth = 0m.

Signed: Nick MuenksDate: 5/7/07

RNC 5-14-07

WBID# 1595



Site# 1 Photo ID# 1595-1-535, Downstream T-1



Site# 1 Photo ID# 1595-1-536, Downstream T-1



Site# 1 Photo ID# 1595-1-537, Upstream T-1



Site# 1 Photo ID# 1595-1-538, Upstream T-1

WBID# 1595



Site# 1 Photo ID# 1595-1-539, Upstream T-1



Site# 1 Photo ID# 1595-1-540, Home and Camper



Site# 1 Photo ID# 1595-1-541, Downstream T-11

Field Data Sheet for Recreational Use Stream Survey

Data Sheet D—Recreational Use Interview
Stream Name ^{PNR} Arthur Creek (WBID # 1595)
Arthur

I. Introduction

Date & Time (include AM or PM): 5/7/07

Interviewed: ☒ In person ☐ By phone ☐ By mail

(NOTE: If you are an Interviewee filling out this form to mail back to DNR, proceed to Question #1.)

Interviewee selected because (e.g., house next to stream; standing by stream, etc.) House next to stream

Interviewer introduction to Interviewee: "My name is _____, I work for __ (name of your employer) __, and I am collecting information on how people use __ (name of the stream) __."

ASK:

1.) Are you willing to respond to a survey about this stream? (It will just take a few minutes.)

☒ Yes ☐ No If yes, list contact information for the interviewee below:

Legal name: Bill Day Arthur
Current mailing address: 9198 Arthur Creek Drive
Daytime phone number: (417) 967-5646
E-mail address (optional):

2.a.) Do you live in this area? ☒ Yes ☐ No

If yes, how many years? 10

2.b.) If you don't live nearby, are you still familiar with this stream? ☐ Yes ☐ No

If yes, how many years?

If no, thank the individual for taking the time to talk to you and conclude the interview.

3.) Are you familiar with this particular stretch of the stream? (show them the map, pointing out local landmarks such as roads, bridges, property lines) ☒ Yes ☐ No

If yes, proceed to "II. Personal Use?".

If no, proceed to Section V.

II. Personal Use?

1.) Have you or your family personally used the stream for recreation since November 28, 1975?

☒ Yes ☐ No

If yes, proceed to #3.

If no, proceed to #2.

2.a.) List reasons stream not used.

2.b.) Proceed to "III. Witnessed Use?".

3.) How do you use the stream?

Swimming

Whole Body Contact Recreation			
Swimming <input checked="" type="checkbox"/>	Tubing <input type="checkbox"/>	Snorkeling/Skin Diving <input type="checkbox"/>	Water Skiing <input type="checkbox"/>

If Interviewee (or family) used the stream for WBCR since Nov. 28, 1975, ask:

4.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?

Summer, weekly during Summer,

4.b.) Where, exactly? Describe specific location and mark on the map (See map requirements in the protocol).

In stream along property - various location along this stretch of stream

Secondary Contact Recreation			
Fishing <input type="checkbox"/>	Wading <input type="checkbox"/>	Boating <input type="checkbox"/>	Trapping <input type="checkbox"/> Other: <input type="checkbox"/> List:

If Interviewee (or family) used the stream for SCR since Nov. 28, 1975, ask:

4.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?

4.d.) Where, exactly? Describe specific location and mark on the map (See map requirements in the protocol).

III. Witnessed Use?

1.) Have you observed others using this stream for recreation since Nov. 28, 1975? ☐ Yes ☒ No

If yes, proceed to #2.

If no, proceed to, "IV. Anecdotal Use?".

2.) What kinds of uses have you witnessed?

Whole Body Contact Recreation			
Swimming <input type="checkbox"/>	Tubing <input type="checkbox"/>	Snorkeling/Skin Diving <input type="checkbox"/>	Water Skiing <input type="checkbox"/>

If Interviewee witnessed WBCR use since Nov. 28, 1975, ask the following questions:

2.a.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)?

2.b.) Where, exactly? Describe specific location *and mark on the map* (Seemap requirements in the protocol). _____

Secondary Contact Recreation

Fishing ☐ Wading ☐ Boating ☐ Trapping ☐ Other: ☐ List: _____

If Interviewee witnessed SCR use since Nov. 28, 1975, ask the following questions:

2.c.) When (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? _____

2.d.) Where, exactly? Describe specific location *and mark on the map* (Seemap requirements in the protocol). _____

IV. Anecdotal Use?

1.) Have you heard about anyone using this stream since Nov. 28, 1975 for recreation – not seen or done yourself, but just heard about it? ☒ Yes ☐ No

If yes, proceed to #2.

If no, thank the individual for taking the time to talk to you and conclude the interview.

2.) What kind of uses have you heard about?

Whole Body Contact Recreation

Swimming ☒ Tubing ☐ Snorkeling/Skin Diving ☐ Water Skiing ☐

If Interviewee heard of WBCR use since Nov. 28, 1975, ask the following questions:

2.a.) When did these uses take place (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? _____
Summer - throughout

2.b.) Where, exactly? Describe specific location *and mark on the map* (See map requirements in the protocol). *Could not specify*

Secondary Contact Recreation				
Fishing <input checked="" type="checkbox"/>	Wading <input type="checkbox"/>	Boating <input type="checkbox"/>	Trapping <input type="checkbox"/>	Other: <input type="checkbox"/> List: _____

If Interviewee heard of SCR use since Nov. 28, 1975, ask the following questions:

2.c.) When did these uses take place (e.g., year(s)?; season?; only after a rain?) and how often (times/year)? 10 - 13 yrs ago (before current owner had property) information he received from previous owners

2.d.) Where, exactly? Describe specific location and mark on the (See map requirements in the protocol). near location where road ends

V. Others to Contact?

Can you recommend someone else we could contact that knows the stream? ☒ Yes ☐ No

If yes, that person's contact info (name, address, phone, directions?) Buford Urban 417-967-2578
neighbor across stream

If no, thank the individual for taking the time to talk to you and conclude the interview.

VI. Additional Comments

1.) From the Interviewee: _____

2.) From the Interviewer: _____

VII. Information on Interviewer

Has interviewer been trained by Missouri DNR to conduct UAA Interviews?

☒ Yes ☐ No If yes, how (check all that apply):

Workshop? (if so, enter date): _____

On-line training seminar? _____

Followed Interview Instruction Sheets? ☒

Other performed interviews during previous UAAs

Interviewer Information:

Signature: Nick Muenks

Printed Name: Nick Muenks

Employer (where applicable): MEC Water Resources

Interviewer's phone #: 573-443-4100

E-mail: nmuenks@mecwater.com